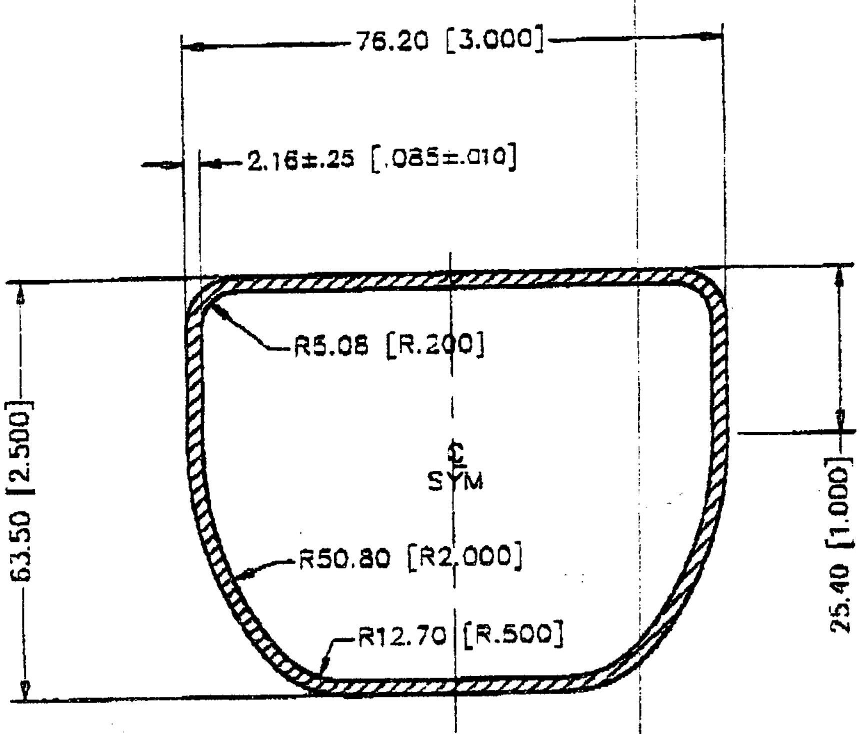
Standard Aluminum Association tolerances apply unless otherwise noted.

UST PART #: D2622	PLANT	EUC	897123
UST PART NAME: CUSTOM HOLLOW	A		
ROPOSAL: REL. DATE	ALLOY 6061		FINISH STD.



PRELIMINARY

FOR APPROVAL ONLY
MUST BE SIGNED BEFORE RELEASE

AUTHORIZATION TO BEGIN DIE CONSTRUCTION

APPROVED BY: [signature] APPROVAL DATE: 00.03.13

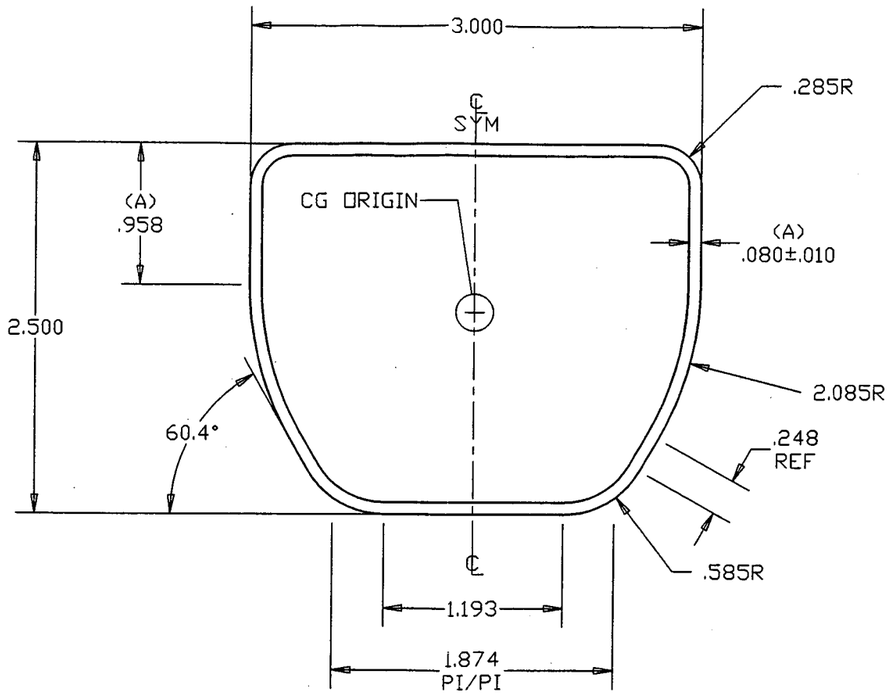
FAXED

WARRANTY: [illegible]

CUSTOMER:	UNSPECIFIED WALLS: SHOWN mm	MASS:	1.442 kg/m	.969 lb/ft
DART AEROSPACE	SHOWN in	EST PER:	482.68 mm	19.003 in
	UNSPECIFIED RADII: SHOWN mm	OUT PER:	248.12 mm	9.769 in
	SHOWN in	EXP PER:	mm	in
	DATE: 3/10/0	BUFF PER:	mm	in
THE WILLIAM L BONNELL CO CAPITOL PRODUCTS CORPORATION BON-L-CAMPO, LP BON-L-CANADA, INC SUBSIDIARIES OF TREDEGAR INDUSTRIES, INC	DRAWN: van	BUFF TURNS:	CLASS:	Hollow II
	SCALE: 1:1	FACTOR:	335 metric	20 imperial
	THM BAR: NO	C.C.D.:	90.17 mm	3.550 in
	P&D CODE: NO	P&D AREA:	mm²	in²

Standard Aluminum Association tolerances apply unless otherwise noted.			DIE NUMBER	REV
CUST PART #:		EUC	DAA-897123	A
CUST PART NAME: CUSTOM HOLLOW		202		
PROPOSAL:	REL. DATE 03/10/00	ALLOY 6061-T6	FINISH MILL	

ALL OUTSIDE SURFACES EXPOSED



DART AEROSPACE LTD
ASSUMES BURDEN OF PROOF OF BONNELL
METAL IDENTIFICATION WITH NO I.D. MARK

WARRANTY:
Bonnell warrants that the product(s) supplied by Bonnell shall be free from defects in workmanship and material and shall conform to all descriptions and specifications, as agreed between Bonnell and Purchaser. BONNELL DISCLAIMS ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WHETHER CREATED BY CONTRACT, BY STATUTE OR OTHERWISE BY OPERATION OF LAW, INCLUDING ALL WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

PURCHASER'S DESIGNS, PLANS, DRAWINGS, SPECIFICATIONS AND REQUIREMENTS.
For any product that is not included in Bonnell's standard product line offered for sale generally in the usual course of Bonnell's business, it is agreed that Purchaser has engaged Bonnell to manufacture such product to Purchaser's specifications and requirements. Bonnell shall not be responsible for the adequacy of prints, drawings, spesifications and requirements respecting such product or for the adequacy of the design represented thereby., Bonnell also shall not be responsible for the adequacy of the materials incorporated in such product or for testing or otherwise determining the sufficiency and applicability of the design. Bonnell shall not be responsible for determining or assuring that such product or the use or application of such product conforms with applicable federal, state or local laws, rules or regulations. Bonnell's only warranty with respect to such products shall be as set forth above: All Designs, plans, prints, or drawings of whatever kind prepared by Bonnell with respect to such products are and shall remain the sole property of Bonnell.

REV	DESCRIPTION OF REVISION	DATE	BY
A	.958 WAS 1.000; .080 WALL WAS .085	09/23/02	KM

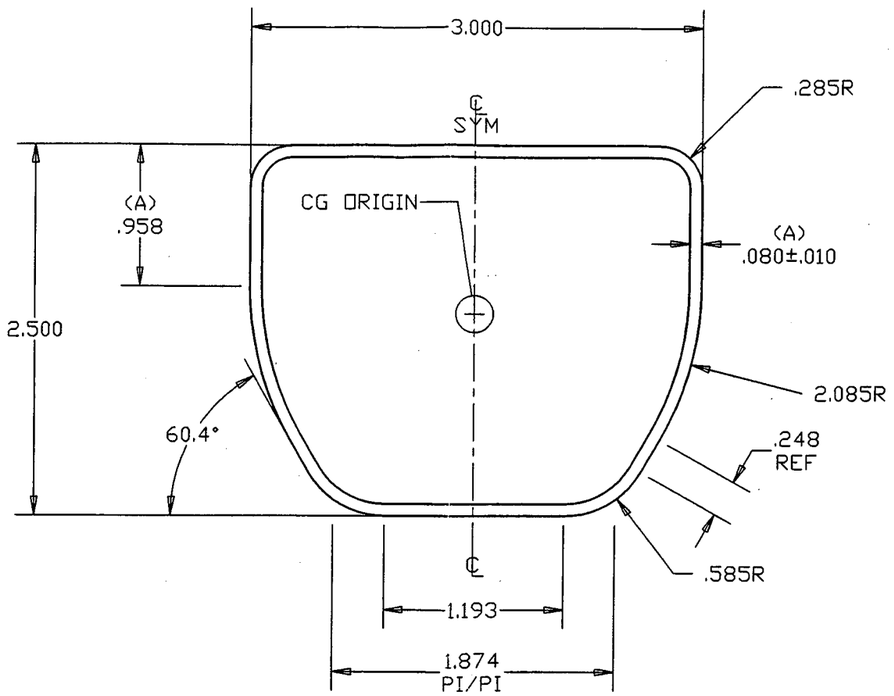
Structural values estimated for reference only.				
Ix:	.2934 x 10^6 mm^4	.705 in^4	Iy:	.3713 x 10^6 mm^4	.892 in^4
Sx:	8.501 x 10^3 mm^3	.519 in^3	Sy:	9.745 x 10^3 mm^3	.595 in^3
CGx:	34.52 mm	1.359 in	CGy:	38.10 mm	1.500 in

DAA-897123

CUSTOMER:	46024	UNSPECIFIED WALLS:	2.03 mm	MASS:	1.357 kg/m .912 lb/ft
DART AEROSPACE LTD.			.080 in	EST PER:	482.50 mm 18.996 in
1270 ABERDEEN ST.		UNSPECIFIED RADII:	.25R mm	OUT PER:	247.63 mm 9.749 in
HAWKESBURY ON K6A 1K7			.010R in	EXP PER:	mm in
THE WILLIAM L BONNELL CO		DATE:	03/10/00	BUFF PER:	mm in
CAPITOL PRODUCTS CORPORATION		DRAWN:	VAN/KR	BUFF TURNS:	CLASS: Hollow II
BON•L•CAMPO, LP BON•L•CANADA, INC		SCALE:	FULL	FACTOR:	356 metric 21 imperial
SUBSIDIARIES OF TREDEGAR INDUSTRIES, INC		THM BAR:	NO	C.C.D.:	94.44 mm 3.718 in
		P&D CODE:	NO	P&D AREA:	mm^2 in^2

Standard Aluminum Association tolerances apply unless otherwise noted.			DIE NUMBER	REV
CUST PART #:		EUC	DAA-897123	A
CUST PART NAME: CUSTOM HOLLOW		202		
PROPOSAL:	REL. DATE 03/10/00	ALLOY 6061-T6	FINISH MILL	

ALL OUTSIDE SURFACES EXPOSED



DART AEROSPACE LTD
ASSUMES BURDEN OF PROOF OF BONNELL
METAL IDENTIFICATION WITH NO I.D. MARK

A	.958 WAS 1.000; .080 WALL WAS .085	09/23/02	KM
REV	DESCRIPTION OF REVISION	DATE	BY

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DAA-897123

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		DATE:	03/10/00	BUFF PER:	mm in
THE WILLIAM L BONNELL CO		DRAWN:	VAN/KR	BUFF TURNS:	CLASS: Hollow II
CAPITOL PRODUCTS CORPORATION		SCALE:	FULL	FACTOR:	356 metric 21 imperial
BON•L•CAMPO, LP BON•L•CANADA, INC		THM BAR:	NO	C.C.D.:	94.44 mm 3.718 in
SUBSIDIARIES OF TREDEGAR INDUSTRIES, INC		P&D CODE:	NO	P&D AREA:	mm^2 in^2

DESIGN	DRAWN BY	DART AEROSPACE LTD VICTORIA INTERNATIONAL AIRPORT, CANADA	
KE	KE		
CHECKED	APPROVED	DRAWING NO.	REV. A
		DR-1034	SHEET 1 OF 1
DATE		TITLE	SCALE
98.03.10		D2622 MODULUS OF RUPTURE	1:1

The purpose of this document is to calculate the maximum allowable bending moment for the D2622 extrusion according to Bruhn, Chapter 3 which allows the modulus of rupture to be extended past Ftu from the MIL Handbook. This methodology was discussed with BHTC engineers on 97.02.24 and deemed to be acceptable for rectangular sections. Figure 1 shows the geometry for the section.

The following are the material properties for the 6061-T6 material used by Dart in extrusion D2622.

$Fm := 42000 \cdot psi$ — Ultimate tensile stress (Bruhn C3.4)

$Fo := 40500 \cdot psi$ — Tensile stress at neutral axis (Bruhn C3.4)

Step Extrusion

$I := 0.745 \cdot in^4$ — Inertia in vertical plane

$c1 := 1.141 \cdot in$ — Distance to outer fibers compression

$c2 := 1.359 \cdot in$ — Distance to outer fibers tension

$A1 := 0.417 \cdot in^2$ — Top Area of Extrusion

$A2 := 0.389 \cdot in^2$ — Bottom Area of Extrusion

$Y1 := 0.851 \cdot in$ — Top Area centroid to N.A.

$Y2 := 0.911 \cdot in$ — Bottom Area centriod to N.A.

$Q1 := A1 \cdot Y1$ $\quad Q1 = 0.355 \cdot in^3$ — Top moment of area

$Q2 := A2 \cdot Y2$ $\quad Q2 = 0.354 \cdot in^3$ — Bottom moment of area

$K1 := \frac{2 \cdot Q1 \cdot c1}{I}$ $\quad K1 = 1.09$ — Shape factor (compression)

$K2 := \frac{2 \cdot Q2 \cdot c2}{I}$ $\quad K2 = 1.29$ — Shape factor (tension)

$Fb1 := Fm + Fo \cdot (K1 - 1)$ $\quad Fb1 = 45523 \cdot psi$ — Modulus of rupture calculated according to Bruhn, Chapter 3 (compression).

$Fb2 := Fm + Fo \cdot (K2 - 1)$ $\quad Fb2 = 53862 \cdot psi$ — Modulus of rupture calculated according to Bruhn, Chapter 3 (tension).

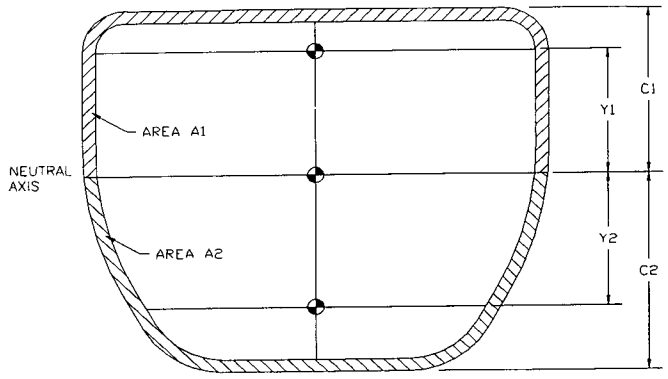
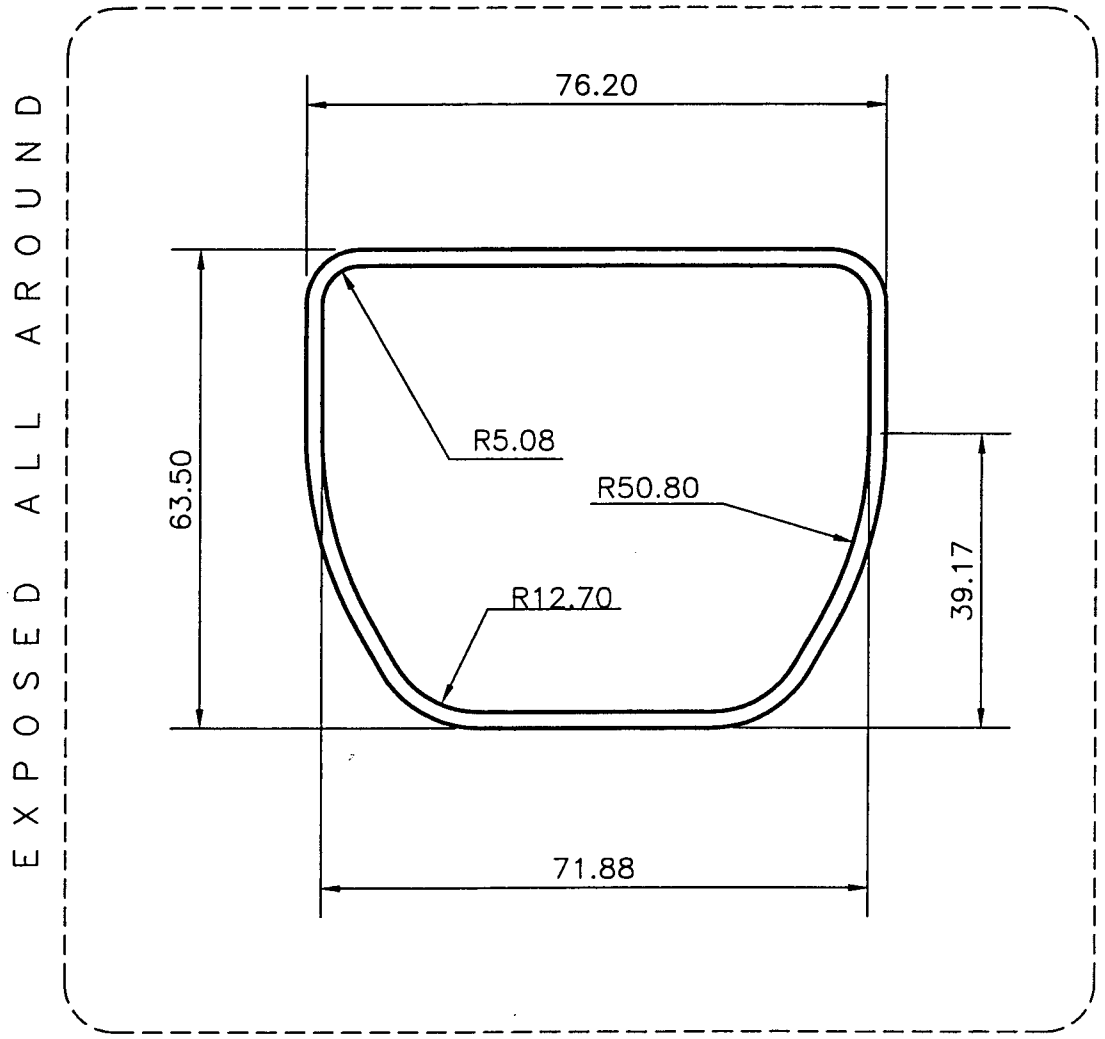


Figure 1 - D2622 extrusion cross section

CLIENT	DART AEROSPACE LTD.	CLIENT No. REF:VH-10883	No. DE PROFILE/DIE No. MH-18869
DESCRIPTION	D2622	DIE LOC. P-1559	No. DE SERIE DASH No. 1
		BACKER LOC.	No. D'OFFRE PROPOSAL No. M18869



ACTUAL SIZE

EPAISSEUR DE PAROIS / WALL THICKNESS 2.16 ±0.25 — EXCEPTE TEL QU'INDIQUE / EXCEPT AS SHOWN

Caradon Indalex
DIVISION OF/DE CARADON LTD.
MONTREAL – TORONTO – CALGARY – VANCOUVER

ARRONDIR TOUS LES COINS AVEC UN RAYON DE 0.25 mm (0.010") SAUF AUTREMENT INDIQUE.
BREAK ALL CORNERS WITH R0.25 mm (0.010" R) UNLESS OTHERWISE SPECIFIED.

TOLERANCES STANDARD SAUF SI INDIQUE
STANDARD TOLERANCES TO APPLY UNLESS OTHERWISE SPECIFIED

SURF. ETABLIE EST. AREA	PO² IN² 520.00 MM²	PER. EXT. OUT PER.	PO IN 247.64 MM
POIDS ETABLI EST. WEIGHT	LBS/PI–FT 1.415 KG/M	FACTEUR FACTOR	20
PER. ETABLI EST. PER.	PO IN 481.71 MM	C.C.D.	IN/PO 90.78 MM
DESSINE PAR DRAWN BY	VERIFIE PAR CHECKED BY	ECHELLE SCALE	1:1 DATE 98,02,16

PRESSE PRESS	CAV.	GRANDEUR DIE SIZE	PKT.	L.I.P.	BACKER GRANDEUR SIZE	BACKER No.
2	1	9X5 1/2				

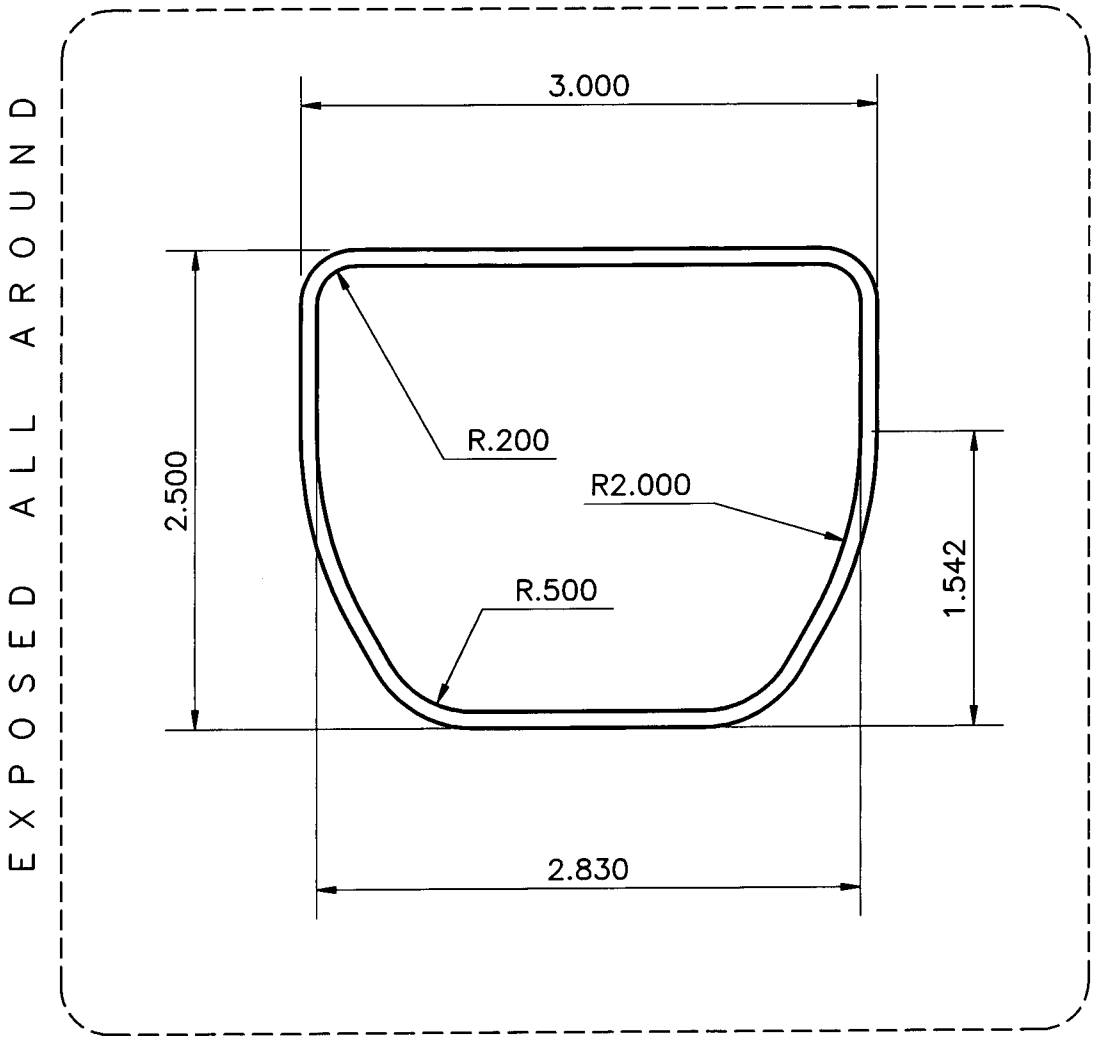
CONT'R	ALLIAGE ET TREMPAGE ALLOY AND TEMPER	FACTEUR D'EXTRUSION EXTRUSION RATIO	SHIM NO.	BOLSTER No.
8	6061–T6	67		SCDIA5

DATE	SYM.	REVISIONS	PAR BY

No. DE PROFILE / DIE No. MH-18869

CUSTOMER	CUSTOMER NO.	PROPOSAL#	DASH	DIE NO.
DART AEROSPACE LTD.	2481	8485B-1		VH-10883
DESCRIPTION: D2622		CLASSIFICATION#		

DATE	SYM	REVISION
97/03		REMOVED I.D. MARK.



ACTUAL SIZE

SUPERCEDED BY
98/03/13 DS

Caradon Indalex

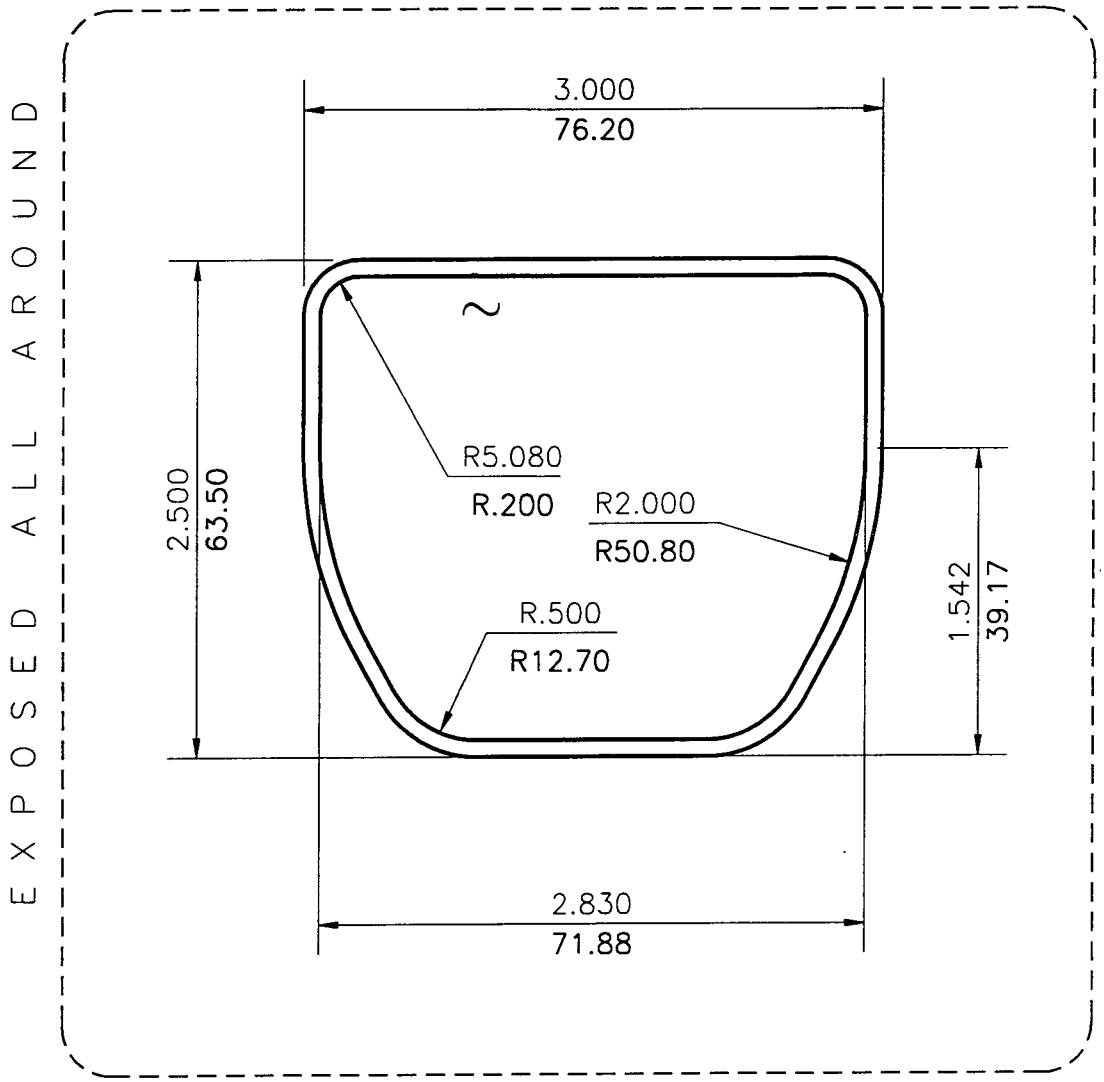
WALL THICKNESS 0.085 IN 2.16 MM EXCEPT AS SHOWN			PRICING: ☐ WT. ☐ PC.	CHECKING GAUGE: ☐ YES. ☐ NO.	LIQ. NITROGEN ☒ YES. ☐ NO.
EST. AREA 0.806 IN² 519.97 MM²	OUT PER. 9.233 IN 234.53 MM		DIE SIZE. 9 X 5.5"	PKT.	DIE LOC.
EST. WT. 0.967 LBS/FT. 1.410 KG/M	FACTOR 20 / 342		BACKER SIZE.		FEEDER SIZE.
EST. PER. 18.983 IN 482.17 MM	C.C.D. 3.074 IN 78.09 MM		BACKER NO. P.H.		FEEDER NO.
DWN BY W.LAM	ALLOY 6061-T6	SCALE 1:1 DATE 97/9/11	BACKER LOC.		FEEDER LOC.
			BOLSTER NO. C11 (A1)	SHIM NO.	CAV. 1
			PRESS NO. 2	CONT'R 188	EXT. RATIO 53

BREAK ALL CORNERS .010"R (0.25R) UNLESS OTHERWISE NOTED.

STANDARD TOLERANCES TO APPLY UNLESS OTHERWISE SPECIFIED

CUSTOMER	CUSTOMER NO.	PROPOSAL#	DASH	DIE NO.
DART AEROSPACE LTD.	2481	8485B-1		VH-10883
DESCRIPTION: D2622	DATE / SYM / REVISION	CLASSIFICATION#		

~ INDALEX I.D. .20mm x 90° V-GROOVE (2x)



ACTUAL SIZE

SUPERCEDED BY
97/09/22 DS

Caradon Indalex

WALL THICKNESS 0.085 IN 2.16 MM EXCEPT AS SHOWN			
EST. AREA 0.806 IN² 519.97 MM²	OUT PER. 9.233 IN 234.53 MM		
EST. WT. 0.967 LBS/FT. 1.410 KG/M	FACTOR 20 / 342		
EST. PER. 18.983 IN 482.17 MM	C.C.D. 3.074 IN 78.09 MM		
DWN BY W.LAM	ALLOY 6005A-T61	SCALE 1:1	DATE 96/12/5
BREAK ALL CORNERS .010"R (0.25R) UNLESS OTHERWISE NOTED.			

PRICING: ☐ WT. ☐ PC.	CHECKING GAUGE: ☐ YES. ☐ NO.	LIQ. NITROGEN ☒ YES. ☐ NO.	
DIE SIZE. 9 X 5.5"	PKT.	DIE LOC.	
BACKER SIZE.		FEEDER SIZE.	
BACKER NO. P.H.		FEEDER NO.	
BACKER LOC.		FEEDER LOC.	
BOLSTER NO. C11 (A1)	SHIM NO.	CAV. 1	
PRESS NO. 2	CONT'R 188	EXT. RATIO 53	
STANDARD TOLERANCES TO APPLY UNLESS OTHERWISE SPECIFIED			

Caradon Indalex

1765 Coast Meridian Road
Port Coquitlam, B.C. V3C 3T7

Telephone (604) 942-6604
Facsimile (604) 942-9424

December 13, 1996

Attn: Mr Jim Bradley
Dart Aero Accessories Inc.
Box 230003 CDO, VIA
Sidney, B.C.
V8L5N7

Dear Mr Bradley,

Please find enclosed copies of extrusion drawings for your files.

Yours truly,
Caradon Indalex, a division of Caradon Ltd.

Delores Tillotson
Sales Coordinator

Encl.

Inertia check using physical tests									
test performed on 97.06.18 and 97.06.19									
Test assumed a point load in the center of a simply supported beam									
basic equation d=PL^3/(48EI)									
common properties									
E	9.90E+06								
L	92.5								
Med bell tube with bonded I beam					**Med bell tube with non bonded I beam**				
theory I	4.54								
platform	Test load	Meas. def	calc I	% diff	platform	Test load	Meas. def	calc I	% diff
7.5	0	0.003	4.16379	-8.3%	7.5	0	0.003	4.16379	-8.3%
7.5	25	0.0135	4.009575	-11.7%	7.5	25	0.0145	3.733053	-17.8%
7.5	50	0.024	3.990298	-12.1%	7.5	50	0.024	3.990298	-12.1%
7.5	75	0.033	4.16379	-8.3%	7.5	75	0.031	4.432421	-2.4%
7.5	100	0.043	4.16379	-8.3%	7.5	100	0.0405	4.420814	-2.6%
7.5	125	0.053	4.16379	-8.3%	7.5	125	0.0505	4.369918	-3.7%
206 tube with light web									
theory I	1.585								
platform	Test load	Meas def	calc I	% diff					
7.5	135	0.165	1.4384	-9.2%					
206 tube with heavy web					**206 tube with heavy web try two**				
theory I	2.304								
platform	Test load	Meas def	calc I	% diff	platform	Test load	Meas def	calc I	% diff
7.5	185	0.165	1.943102	-15.7%	7.5	165	0.1585	1.812628	-21.3%
Light step extrusion D2644									
theory I	0.7454								
platform	Test load	Meas def	calc I	% diff					
7.5	59.69	0.157	0.712777	-4.4%					

97/06/23/BW

Conclusion:
Light Step extrusion (D2622): Deflection and strength are ok to use theoretical values. Be awair that deflections may be up to 5% greater than theory an margins must be greater than .05

206B light: deflections are within range ok to use theory
Deflections may be up to 9% greater than expected
Margin must be greater than .095

205: deflections are with range OK To use theory
deflection may be 8% greater Margin to be larger than .085

206 B Heavy: deflections are too large: may be due to improper "I"
deflection check to be done on modified "I" shap to conform theory

9/06/19 BW

deflection of extrusion verification conclusions

Excluding the 206 Be heavy

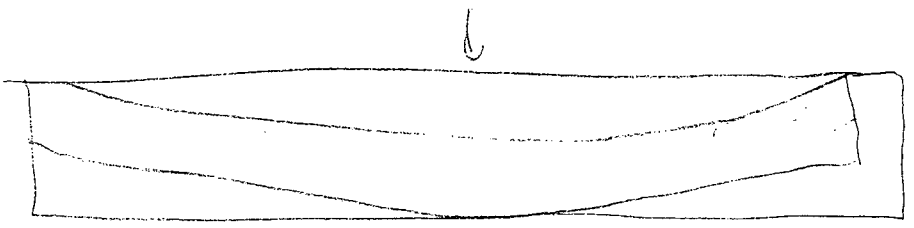
- error averages approx - 6.5 %
- in Terms of deflection ~~(5~~ (0.15") error = 0.010"
- in terms of Youngs modulus E error $5.9e^5$ or $10.5e^6 \Leftrightarrow 9.3e^6$

~~The~~

- The discrepency in inertias could be in a combination of Youngs modulus + weigh being applied
- Deflection check OK

206 B Tube Cheavy

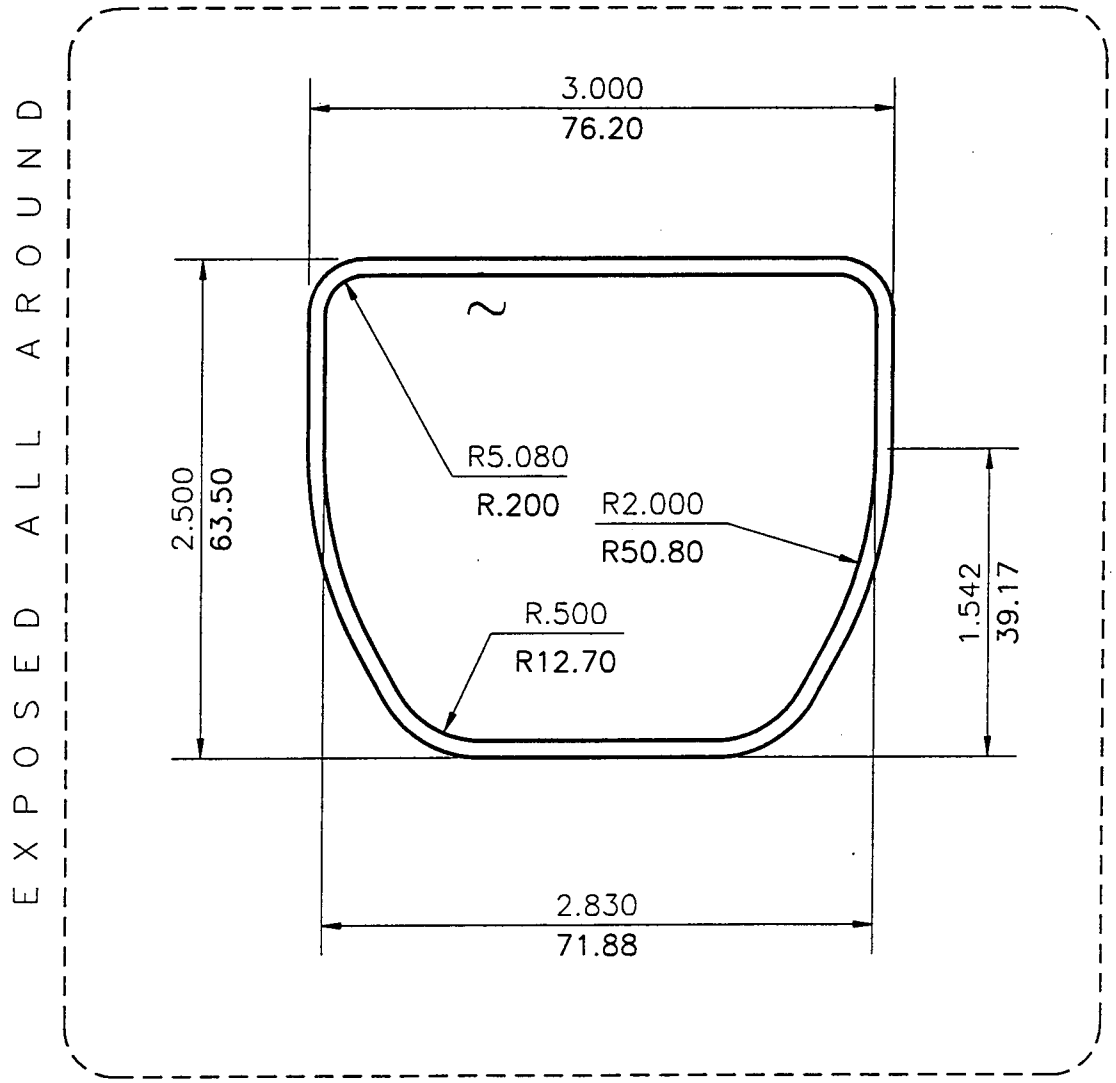
- discrepency is 16 - 21 %
- The inner web has the largest nominal gap relative to Tube dia, allowing outer Tube to flex before they act together
- Two extrusions acting independantly



- Posibly sand weight is off: [checked Bag weight @ 170 lb not 165 with new weight error drops to 19%
- Posibly web has lower inertia than thought
- 21% of 0.165" = .034"
- "I" Beam made small. This reduces its inertia + therefore the overall inertia of the Tube.
- Final Prod web should be ok But should check

CUSTOMER	CUSTOMER NO.	PROPOSAL# 8485B-1	DASH	DIE NO.
DART AEROSPACE LTD.	2481	CLASSIFICATION#		VH-10883

DESCRIPTION: D2622	DATE	SYM	REVISION
			~ INDALEX I.D. .20mm x 90° V-GROOVE (2x)



ACTUAL SIZE

Caradon Indalex

PRICING: ☐ WT. ☐ PC.	CHECKING GAUGE: ☐ YES. ☐ NO.	LIQ. NITROGEN ☒ YES. ☐ NO.	
DIE SIZE. 9 X 5.5"	PKT.	DIE LOC.	
WALL THICKNESS 0.085 IN 2.16 MM	EXCEPT AS SHOWN	BACKER SIZE.	FEEDER SIZE.
EST. AREA 0.806 IN^2 519.97 MM^2	OUT PER. 9.233 IN 234.53 MM	BACKER NO. P.H.	FEEDER NO.
EST. WT. 0.967 LBS/FT. 1.410 KG/M	FACTOR 20 / 342	BACKER LOC.	FEEDER LOC.
EST. PER. 18.983 IN 482.17 MM	C.C.D. 3.074 IN 78.09 MM	BOLSTER NO. C11 (A1)	SHIM NO. / CAV. 1
DWN BY W.LAM	ALLOY 6005A-T61	SCALE 1:1	DATE 96/12/5
PRESS NO. 2	CONT'R 188	EXT. RATIO 53	

BREAK ALL CORNERS .010"R (0.25R) UNLESS OTHERWISE NOTED.

STANDARD TOLERANCES TO APPLY UNLESS OTHERWISE SPECIFIED